

and the stent are helically wound to form a spiral configuration where both have the same angular orientation with respect to the longitudinal axis of the graft.

[0012] The use of such a broad coupling member, however, may present a variety of problems. The use of such a broad coupling member also may decrease the overall flexibility of the prosthesis. The use of a broad coupling member may furthermore, increase radial stiffness of the prosthesis. In addition wrapping the ribbon about the stent at the same angular orientation as the stent tends to decrease the flexibility and expandability of the stent.

[0013] It is desirable to provide a stent/graft composite device which secures the stent to the graft without exhibiting a significant reduction in longitudinal compliance or flexibility.

SUMMARY OF THE INVENTION

[0014] It is an advantage of the present invention to provide an endoluminal prosthesis including a stent/graft composite device having increased flexibility.

[0015] It is also an advantage of the present invention to provide a stent/graft composite device where the stent is secured to the graft so as to not reduce the flexibility and longitudinal compliance of the device.

[0016] The present invention provides a thin suture, or filament-like securement member which secures the stent to the graft by being helically arranged at an angle with respect to the longitudinal axis of the graft, such that the angle does not equal the angle formed with respect to the helical windings of the stent. The present invention is designed to be able to provide structural integrity for the prosthesis while also substantially reducing its size. The prosthesis exhibits a reduced profile and increased flexibility over prior art. Furthermore, by angularly orienting the wrap with respect to the stent, the radial wrap provides the prosthesis with a more efficient means of securing the stent cohesively together. The angular orientation in regard to the stent, further provides a more efficient means of securing the stent to the tubular member.

[0017] In attaining these and other advantages, the present invention provides an endoluminal prosthesis comprising a polytetrafluoroethylene tubular member with a luminal surface, an exterior surface, and a longitudinal axis. A diametrically deformable stent is circumferentially disposed on the luminal or exterior surface of said tubular member, said stent being formed from an elongate wire helically wound defining a plurality of spaced apart windings disposed at a first angle with respect to said longitudinal axis, and an elongate securement member securing said stent to said tubular member, said securement member being helically arranged at a second angle with respect to said longitudinal axis so that said first angle is not congruent to said second angle.

[0018] A method of making the endoluminal prosthesis of the present invention is also disclosed. The method comprises providing a polytetrafluoroethylene tubular member, said tubular member comprising a luminal surface, an exterior surface, and a longitudinal axis. The method of making the prosthesis further comprises disposing a diametrically deformable stent circumferentially on the luminal or exterior surface of said tubular member, said stent being formed from an elongate wire helically wound defining a plurality of spaced apart windings disposed at a first angle with respect to said longitudinal axis; and helically wrapping an elongate securement member to secure said stent to said tubular member, said elongate securement member being wrapped at a second angle with respect to said longitudinal axis, so that said second angle is not congruent to said first angle of said stent.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] Figure 1 is a perspective showing a collapsed wave-like stent which may be used in the present intraluminal prosthesis.

[0020] Figure 2 is a perspective showing a stent similar to the stent of Figure 1 expanded about an exterior surface of an ePTFE graft tube.

[0021] Figure 3 is a perspective showing a composite endoluminal prosthesis comprising another stent embodiment disposed on the exterior surface of a tubular member.

[0022] Figure 4 is a perspective showing of the endoluminal prosthesis of Figure 3 including a securement member for supporting the stent to the graft.

[0023] Figure 5 is a perspective showing a further embodiment of the present invention with the securement member angularly oriented at two different angles to secure the stent to the tubular member.

[0024] Figure 6 is a perspective showing of a still further embodiment of an endoluminal prosthesis of the present invention wherein the securement member forms loops around elbows of the stent.

[0025] Figure 7 is a perspective showing of yet another embodiment of an endoluminal prosthesis of the present invention wherein the securement member loops around leg segments of the stent.

[0026] Figure 8 is a perspective showing another embodiment of the endoluminal prosthesis of the present invention wherein a nested stent is shown with a securement member securing said stent at its elbows.

DETAILED DESCRIPTION OF THE INVENTION

[0027] The following is a detailed description of the preferred embodiments of the present invention. The description is meant to describe preferred embodiments, and is not meant to limit the invention in any way.